

Missouri Resources

Winter 2016 • Volume 33 • Number 1



director's comment



"Essentially, all life depends upon the soil ... There can be no life without soil and no soil without life; they have evolved together," said Dr. Charles E. Kellogg, soil scientist and former chief of the U.S. Department of Agriculture's Bureau of Chemistry and Soils. Dr. Kellogg's legacy of bringing awareness to the importance of soil data was built around his belief that soil is the foundation of life.

Healthy soil provides us with clean air and water, productive crops and grazing fields, diverse wildlife and beautiful rural sceneries. It's a quality of life we all cherish and one we

have come to expect. However, our soil quality has not always been healthy. In fact, Missouri once held the second highest rate of erosion in the nation. Soil once used as productive agriculture land has polluted our waterways.

In order to reduce soil erosion, improve water quality as well as support Missouri state parks, Missouri voters passed a one-tenth-of-one-percent sales tax in 1984, now called the

Parks, Soils and Water Sales Tax. Missourians have continued to show their support for these efforts by renewing the tax in 1988, 1996 and 2006. The tax is set to expire in 2016 unless renewed.

The Department of Natural Resources has administered funds generated from the tax through county soil and water districts to Missouri landowners to implement voluntary practices that have kept more than 177 million tons of soil from eroding into our waterways. The department through local, state and federal partnerships promotes good farming tech-

niques that keep soil on our fields and our waters clean while conserving the productivity of Missouri's 97,000 farms.

While these efforts have drastically improved our soil and water quality, it's no longer enough due to increased population and food production demands. With help from our partners, the department will increase the amount of soil data collected through the state's premier Soil Health Assessment Center at the University of Missouri-Columbia. Agricultural landowners will submit soil samples for analysis that will provide the state with a new baseline for soil health and help determine which voluntary practices are improving the quality and productivity of our soil the most. I believe Dr. Kellogg would be proud of Missouri's efforts. Learn more at dnr.mo.gov.

Sara Parker Pauley
Missouri Department of Natural Resources

Missouri Resources

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Mission Statement

The mission of the Missouri Department of Natural Resources is to protect our air, land and water; to preserve our unique natural and historic places; and to provide recreational and learning opportunities for everyone.

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by Larry Archer

With zero paperwork and only three questions to answer, you can safely and easily rid your home or farm of old and leftover pesticides. The Missouri Pesticide Collection Program begins its fifth year in 2016 and the department hopes to continue the effort well into the future.

12 2015 MissouriDNR Photo Contest Winners

Our 2015 competitors reminded us just how diverse Missouri's natural beauty is – and how difficult it is to pick the winners.

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Above: Beloved Missouri artist Thomas Hart Benton's home and studio is preserved in Kansas City (see story page 18). *DNR photo by Ben Nickelson.*

Front Cover: A fly fisherman lands a trout on a cold 2015 opening day at Bennett Spring State Park near Lebanon. *DNR photo by Andrew Richmond.*

Back Cover: Anglers enjoy trout opening day 2015 at Roaring River State Park near Cassville. *DNR photo by Ben Nickelson.*

The Remarkable History of Bothwell Lodge

by Josh Expose

photographs by Ben Nickelson

It took 31 years for John Homer Bothwell to complete work on his country home. Over that time, the attorney from Sedalia developed the residence into a 31-room lodge. Today, guests can learn about his life and his home by touring Bothwell Lodge State Historic Site.

One of the most interesting aspects of the home is the story of Bothwell himself. Born Nov. 20, 1848, in Maysville, Ill., he enrolled at Indiana University at the age of 17. After graduating from law school in Albany, N.Y. in 1871, Bothwell moved to Sedalia where he opened a law office.



Besides his career as a lawyer, Bothwell was heavily involved in business and politics. He was president of the Sedalia National Bank for two years and served as a member of the Missouri House of Representatives in 1888, 1894, 1902 and 1904. Bothwell represented constituents in the eastern half of Pettis County.

“As a state representative, Mr. Bothwell was on several house committees including the committees of the Judiciary, Penitentiary and Joint Rules,” explained Lindsay Burks as she led a tour through the historic site. “Mr. Bothwell became involved with the Tax Revision Commission in 1906 and represented Missouri at the National Con-

Bothwell Lodge State Historic Site sits atop Stonyridge Bluff just north of Sedalia, in Pettis County.



(Top and above) The lodge's personal library contains over 1,500 holdings from the 1880s and early 1900s. (Above right) Stonyridge Trail follows what was the original driveway that led from Marshall Road (old Highway 65) up to the top of Stonyridge Bluff.



servation Congress in 1910," added Burks, an interpretive resource specialist at the historic site.

As president of the Sedalia Board of Trade, Bothwell was responsible for persuading the Missouri Pacific Railroad to locate manufacturing and repair shops in Sedalia, resulting in more than 1,800 new jobs. Bothwell also led efforts for the Missouri State Fair to locate its permanent home in Sedalia. In addition, Bothwell was a leading voice in an effort to relocate the state capitol from Jefferson City to Sedalia, and encouraged growth in Sedalia by helping to establish a new hotel and hospital. Both facilities bear his name.

As an investor, he organized the West St. Louis Water and Light Company in 1902. Bothwell served as the president and director, creating a water supply system for the residents of St. Louis County. The company also provided water to the towns of Clayton, Kirkwood, Webster Groves, Maplewood and Wellston.

Bothwell purchased the property he called Stonyridge Farm in 1896, now the location of Both-

well Lodge State Historic Site. The castle-like home was originally designed as a seven-room country retreat. Later additions developed the home to accommodate frequent visitors, including Bothwell's family and friends. Today, the home resembles a castle on a hill.

Most of the majestic structure's attributes provide a glimpse into Bothwell's many interests. It consists of 31 rooms that illustrate many cultural and architectural designs between 1890 and 1929. The historic site includes 10 guest bedrooms, Bothwell's bedroom, four sitting rooms, a music

(Right, far right, below) Most of the original furnishings in the 31-room lodge, such as dining, office and bedroom furniture, remain today. (Opposite page, bottom) Interpreters are available for tours when visiting Bothwell Lodge State Historic Site.



room, a basement and workshop, five and one-half bathrooms and a home office and study.

The historic site also includes Bothwell's personal library, where he kept more than 1,500 books dated from the late 1880s to the early 1900s.

"It's my favorite room of the house," Burks said. "The library houses books of nearly every genre, including mysteries, poetry, classics, and even how-to books. I think having books for everyone highlights Mr. Bothwell's generosity."



Another interesting feature and hint to Bothwell's personality is a room with a sink next to the library.

"He had one strict rule, if you were going to come in and read his books, you had to wash your hands first," said Burks.

The lodge was built atop a 120-foot bluff that contains two caves. One of the caves is connected to the basement. Bothwell had hoped to employ this strategic connection as an air-conditioning system.

John Bothwell died in 1929 from Bright's disease. He left his home to 38 friends and family members, a group he referred to as The Bothwell Lodge Club.

"I think it's so amazing that he left so much to his friends and family," Burks said.

In his will, Bothwell specified that once the club totaled less than five original members, the home would be offered to the State of Missouri for use as an educational or charitable institution. The group used the lodge for more than 40 years. In 1974, the property was established as Bothwell State Park. It later was transitioned into a historic site in recognition of its distinct historic value.

Today, the site offers outdoor hiking and mountain biking opportunities for visitors to experience on two paths: Stonyridge and Radiant trails. Stonyridge Trail was the original driveway that Bothwell built in the 20th century that led to the top of the bluff and Bothwell's lodge.

Along the trail, there are two stone structures that were built by Bothwell in the early 1900s: the Gypsy Camp and the Gazebo. Radiant Trail was built and completed by volunteers in 2006. The name of the trail comes from a favorite poem of Bothwell's, *Life in Abundance* by Elbert Hubbard.

To view the tour schedule or to find more information on Bothwell Lodge State Historic Site, visit mostateparks.com. 🐾

Josh Expose was a 2015 summer intern with Missouri State Parks, a division of the Missouri Department of Natural Resources.



There's NO PLACE like HOME

by Judy Stinson

**Envirothon participants from
Pembroke Hill High School
pose for a photograph in
front of a Wizard of Oz-
themed backdrop. The 2015
Envirothon theme was
“Welcome to the OZarks.”
Pembroke Hill also won the
2012 national competition,
held in Pennsylvania.**

With the theme for the 2015 national Envirothon competition being Welcome to the OZarks – a spin-off of the Wizard of Oz, the five-member Envirothon team from Missouri quickly realized there’s no place like home.

Missouri hosted the 2015 National Conservation Foundation Envirothon, North America’s largest high school environmental competition, and Missouri’s team took first place at home. They also received the top resource awards in the following categories: current issue, aquatics, and oral presentation. Each student received a \$3,000 scholarship provided by Smithfield Foods.

Two hundred sixty students from 44 states, seven Canadian provinces, and one Canadian territory made their way to the campus of Missouri State University in

Springfield on July 27 for the weeklong event. Pembroke Hill High School from Jackson County represented Missouri at the 2015 NCF-Envirothon. They competed against 16 teams to win the state Envirothon competition in early May 2015. Team members were Eric Koch, Domenico DiMare, Saurabh Goel, Francesco DiMare and Devon Dietrich. Their advisors were SueAnn and Rick Wright.

After students unloaded, unpacked, registered and got their team pictures taken, a trading session followed later that evening, giving students a chance to interact with each other. Students rushed from one table to another, trading T-shirts, hats and a variety of other items that proudly displayed their state or province’s name. The opening ceremony was held the next morning and



(Left, below and bottom) The Envirothon is a “day in the field” that tests students’ knowledge and problem-solving skills at four ecostations – Soils/Land Use, Aquatic Ecology, Forestry, Wildlife, and a fifth station for oral presentations on current environmental issues.



Jan Fisk, a Springfield city councilwoman, delivered a proclamation from the mayor that declared July 27-31 as Envirothon Week in the city.

Following the opening ceremony, students participated in an intense week of training and testing about natural resources.

Training sites at Bois D’Arc Conservation Area, The Watershed Center and Fassnight Park provided excellent opportunities to learn more about environmental resources of the Ozarks. The students spent several hours at resource stations learning about aquatic ecology, forestry, soils and land use, wildlife and urban forestry.



(Above and below) Envirothon competitors give an oral presentation and participate in hands-on problem-solving activities.

The competitors saw karst topography, including a spring and a sinkhole, while they learned about watersheds. They knelt in soil pits, walked in the woods and carefully examined different methods of protecting trees during construction. Notes about the social and economic benefits of trees, conservation, preservation and many

more environmental topics were included in the students' notebooks.

After a full day of intense training on Missouri's resources, the students ventured out for a full day of testing at Nathanael Greene/Close Memorial Park and the Darr Agricultural Center. During testing they examined wildlife pelts, fish, streams and trees. Competitors were clearly up for the challenge, in fact, most started studying resource materials long before they arrived in Springfield.

"As the test writer coordinator for this event, I realize that one of the most important features of the Envirothon competition is the emphasis placed on hands-on, problem-solving activities that the students use at all the testing stations, said DeDe Vest, urban conservationist for the Natural Resources Conservation Services. "This program encourages students in the United States and Canada to become better environmental stewards of our land," Vest added. "The test uses the ecosystem approach and allows students to understand how everything works together."

More challenges awaited the students. They still had to prepare an oral presentation but that would have to wait for later. After a long day of testing, they relaxed at a dance provided by the Envirothon committee. The next day everyone went to Silver Dollar City for a day of fun and adventure. This allowed all the participants an opportunity to see a little bit of southwest Missouri.

On Friday, students spent the afternoon preparing their oral presentations after gathering information from three speakers who



presented training that morning. On Saturday, between games of table football, cards and much-needed naps, teams practiced their speeches and waited anxiously for their turn to present.

After preliminary presentations, the top four teams were announced: Massachusetts, Texas, Pennsylvania and Missouri. Each team then gave a final presentation to a panel of seven judges, including Missouri Department of Natural Resources Director Sara Parker Pauley. Other judges included Mike Squires from the Natural Resources Conservation Service; Tim Ripperger from the Missouri Department of Conservation; Sue Cummings from the U.S. Forest Service; Rob Keen, a registered professional forester from Ontario, Canada; Richard Fordyce, director of the Missouri Department of Agriculture; and Nedra Turney from the National Conservation Foundation.

More than 150 volunteers helped with the week-long event, including representatives from the Missouri Department of Natural Resources, Missouri soil and water conservation districts, Missouri Association of Soil and Water Conservation Districts, Missouri Association of Soil and Water Conservation Districts Employee's Association, Missouri Department of Conservation, Natural Resources Conservation Service, University of Missouri Extension, and the Springfield community, as well as others.

At the closing ceremony Colleen Meredith, the Department of Natural Resources' Soil and Water Conservation program director, accepted an award recognizing the department for its continued support of the Envirothon.

Like Dorothy in the Wizard of Oz, all 260 students that participated in this national Envirothon event took a journey that provided them with numerous life lessons along the way. They learned the value of friendship they found with students from other states, provinces and territories. All Envirothon competitors found themselves challenged mentally and physically, and learned to trust their teammates, realizing



DNR photo by Van Beydler



DNR photo by Van Beydler

that the end score they received required their ability to work together.

After the grueling but rewarding week-long event, the five Missouri students, their advisors, and all the Missourians involved in the competition agreed – there really is no place like home! More information about the Missouri Envirothon can be found at moenvirothon.org. 🐾

Judy Stinson is an environmental education specialist for the Department of Natural Resources' Soil and Water Conservation Program. She serves as co-chair of Missouri's annual Envirothon competition.

(Top and above) Two hundred sixty students from 44 states, seven Canadian provinces and one Canadian territory took part in the 2015 National Envirothon at Missouri State University in Springfield.

Missouri Pesticide Collection Program: Picking Up Pesky Poisons

by Larry Archer

photographs by Ben Nickelson



(Above and above right)
Hazardous waste contractors sort pesticide waste into plastic-lined boxes, based upon physical and chemical properties. An absorbent material is added to the boxes to further secure the contents.

Pesticides are designed to get rid of unwanted insects and related pests, but what happens when the hazardous pesticides themselves become unwanted?

In barns, sheds and basements throughout Missouri, unused containers of pesticides sit – sometimes for decades – with the farmer or homeowner having few options for their proper disposal. These containers would sit on the shelves as silent threats to both our health and natural resources. But, since 2012, the Missouri Department of Natural Resources has been providing convenient opportunities for us to rid ourselves of these pesky poisons.

The department has conducted 26 pesticide drop-off events – known collectively as the Missouri Pesticide Collection Program – throughout the state, collecting nearly 200,000 pounds of pesticides. The pesticide drop-off events are free to Missouri residents.

“Almost everybody in the farming public has a jug, a container or multiple containers of product that’s gotten old,” said Trent Haggard, director of the University of Missouri’s Delta Research Center in Portageville in southeast Missouri. The department partnered with the Delta Research Center in May on a collection that netted nearly 30,000 pounds of pesticides.

Most of the participants in the program are grateful for the opportunity to dispose of these chemicals, according to C.J. Plassmeyer, an en-

vironmental specialist who coordinates the pesticide drop-offs for the department's Hazardous Waste Program.

"They're almost to the point they're relieved to get this stuff out of their barns and homes," Plassmeyer said.

How long some of these pesticides have been collecting dust is evident by the types of chemicals staff and contractors are seeing, according to Plassmeyer.

"We've collected DDT, which is a pesticide that was banned in 1972, at nearly every event," he said.

amount sufficient to get the job done without leftovers.

There is no paperwork, and staff only ask participants three questions: if the participant is a Missouri resident or farmer (the collections are not open to businesses); how the participant learned of the event (in order to better publicize future events); and what town the participant is from (to determine how far people are traveling for the pesticide drop-offs).

Haggard said the farmers with whom he

(Below) Contractors collect waste pesticides from a participant's vehicle.



Haggard pointed out that many of the participants he spoke with were bringing in leftovers that spanned generations.

"I had conversations with folks and asked, 'How old do you think some of this is?' and some of them would say, 'I think this was my grandfather's, and I think these were my dad's,'" he said.

The program begins its fifth year in 2016, and is likely to continue beyond – depending on funding, Plassmeyer said. The Missouri Pesticide Collection Program webpage – dnr.mo.gov/env/hwp/pesticide – provides information about scheduled collections and the safe use and disposal of hazardous pesticides.

The department also offers participants suggestions for avoiding future pesticide surpluses. Suggestions include carefully reading the product label before buying in order to make sure what is being purchased is the right product for the job, and in an

spoke were impressed by the efficiency with which staff and contractors handle the collection and disposal process.

"All they had to do was bring it. Drop it off. No strings attached. They were just blown away by just how simple and easy this was," Haggard said.

"They drive up; everybody starts picking everything off their truck and processing it. All of a sudden you have an empty truck and you're done." 🐾

Larry Archer is the division information officer for the department's Division of Environmental Quality. Dennis Hansen, an environmental specialist with the department's Hazardous Waste Program, contributed to this article.

(Below) A "Cubic Yard Box" full of waste pesticide is weighed prior to being shipped to an offsite incinerator.



2015 MissouriDNR Photo Contest Winners

The Missouri Department of Natural Resources received 210 entries for its second annual MissouriDNR Photo Contest held March 1-Aug. 1. First, second and third places, as well as an honorable mention were selected from each of the three categories – Natural Resources, People Enjoying Missouri’s Waterways, and Unique Places.

Joy Park, a 16-year-old from Columbia was pleased to find a brief mo-

ment of silence while visiting Cosmo-Bethel Park. Her second-place winning photograph documented a pair of swans she had watched before, however, this time they both appeared wholly in nature.

She wrote, “The local lake’s clarity intensified, and the pair of swans that I so often saw appeared 10 times as majestic. As the swans were feeding, their heads popped out of the water, creating ripples every which way.

Water dripped from their radiant orange beaks, encouraging the ripples to widen. They were so crisp and so clear, hence the name of (her) photograph, ‘Clarity.’”

Congratulations to everyone who entered the contest and helped capture the beauty of Missouri’s natural and cultural resources.

To learn more about the 2015 MissouriDNR Photo Contest, visit dnr.mo.gov/photocontest.

Natural Resources



FIRST PLACE **Don York, Ballwin** *Round Spring - Round Spring, Shannon County*

SECOND PLACE

Joy Park, Columbia

Clarity - Cosmo-Bethel Park,
Columbia



THIRD PLACE

Don York, Ballwin

Alley Spring - Alley Spring,
Shannon County



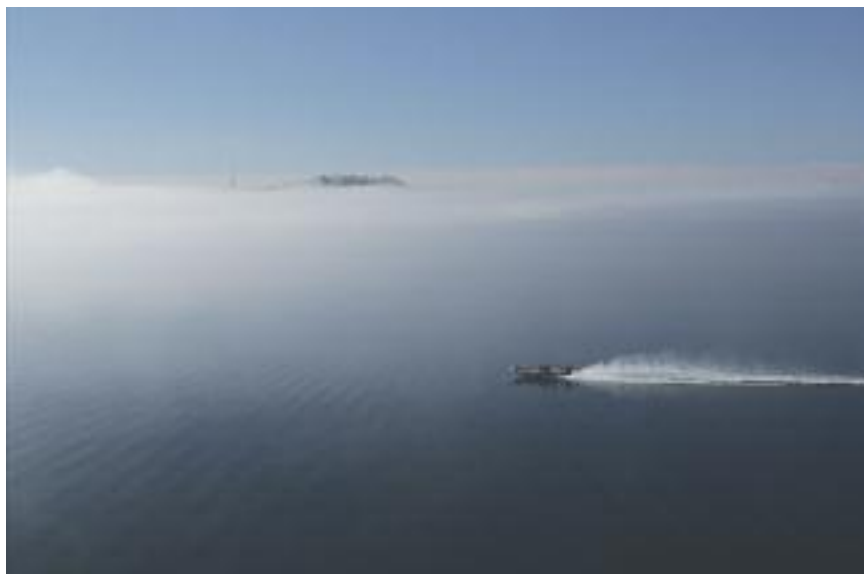
HONORABLE MENTION

Marty McKay, Alton, Ill.

March Sunrise at the Riverlands -
Riverlands, St. Charles County



People Enjoying Missouri's Waterways



FIRST PLACE

Marty McKay, Alton, Ill.

*Fall Sailing on the Mississippi -
St. Charles County (above)*

HONORABLE MENTION

Stephen Carter, Wildwood

*Foggy Morning on Table Rock Lake - Table
Rock Lake, Stone County (left)*



SECOND PLACE

Eric Allen, Columbia

Fall on Cedar Creek - Rutherford Bridge, Boone County (above)

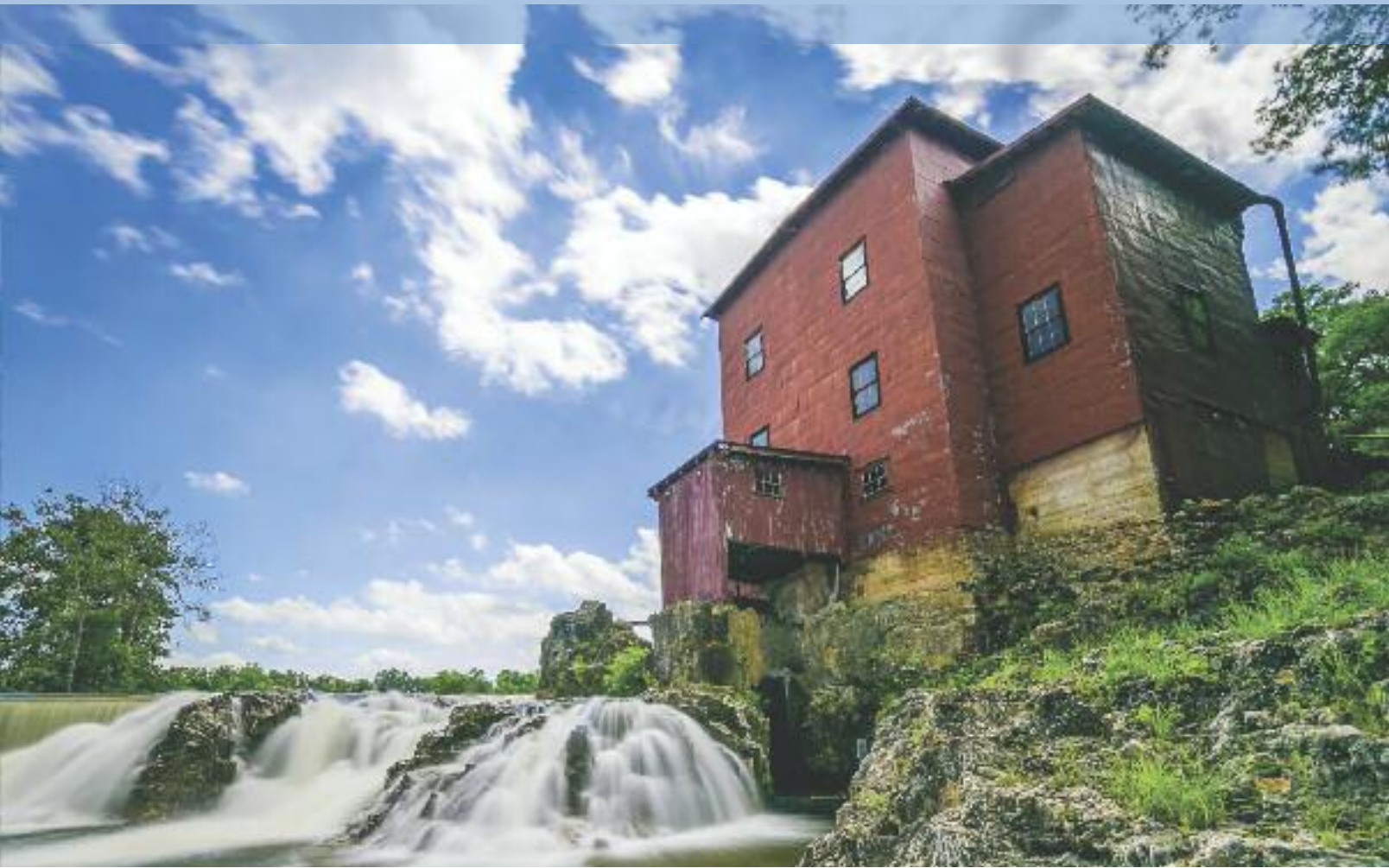
THIRD PLACE

Don York, Ballwin

Kayak Championships - Millstream Gardens Conservation Area, Shannon County (right)



Unique Places



FIRST PLACE

**Steve Eichelberger,
Columbia**

Rushing Water - Dillard Mill
State Historic Site, Davisville
(above)



THIRD PLACE

Eric Nichols, O'Fallon

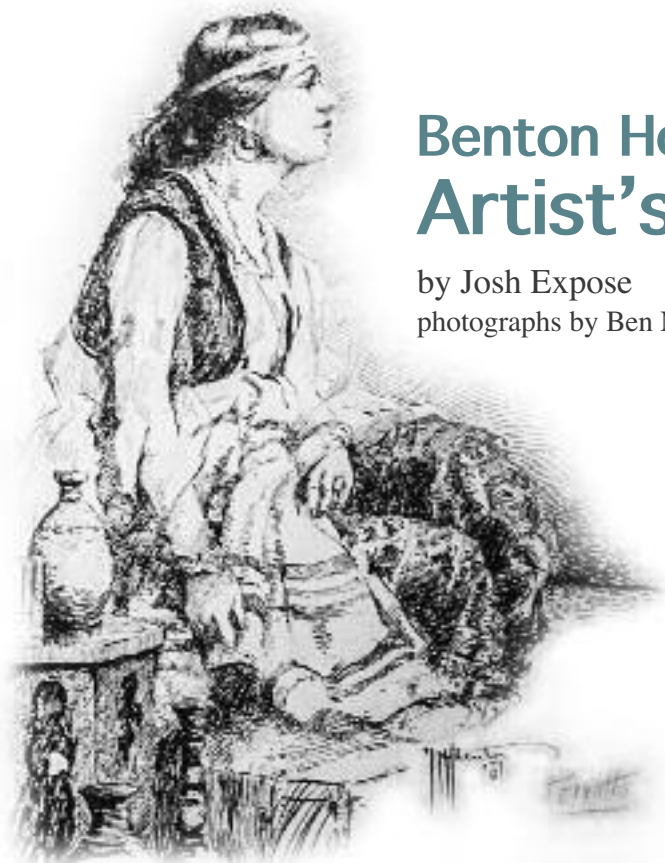
Morning at Montauk - Montauk
State Park, Salem (right)



SECOND PLACE
Chris Heffner, Fulton
Bike Ride! - Katy Trail State
 Park, Boone County

**HONORABLE
 MENTION**
**Jane Linders,
 Maryland Heights**
Ha Ha Tonka Walkway -
 Ha Ha Tonka State Park,
 Camden County





Benton Home Chronicles Artist's Amazing Journey

by Josh Expose

photographs by Ben Nickelson

When Thomas Hart Benton was 7 years old, he used charcoal to draw a long train on the wall that ran up the staircase in his parents' home in Neosho, Mo. The drawing was not well received, but it did mark the beginning of Benton's journey as an artist.

"Thomas Hart Benton liked to draw and doodle from a very early age, especially trains, people he knew, and Custer's Last Stand," said Steve Sitton, site administrator at Thomas Hart Benton Home and Studio State Historic Site, located in Kansas City, Mo.

In 1897 after the family moved to Washington, D.C., Benton's mother enrolled him in art classes at the Corcoran

(Above left) A classroom drawing, done under the instruction of Ernest Peixotto, is one of the earliest surviving drawings by Thomas Hart Benton.

(Below) Thomas Hart Benton Home and Studio State Historic Site in Kansas City was Benton's home from 1936 until he died in 1975.



Gallery. In 1906, at the age of 16, Benton worked as a cartoonist for the Joplin American newspaper, producing exaggerated caricatures of local businessmen and politicians. The next year, he enrolled at the Art Institute of Chicago. “From the moment I first stuck my brush in a fat glob of color, I gave up the idea of newspaper cartooning,” Benton said. “I made up my mind that I was going to become a painter.”

The public can learn more about the life of Benton and view some of his artwork at the Thomas Hart Benton Home and Studio. The collection now includes a 1907 drawing – the earliest Benton piece to ever to be exhibited – added on April 21, 2015.

“There is very little of Tom Benton’s early work which survived,” said Sitton. “His parents’ home in Neosho burned in 1917, destroying almost all of Tom’s childhood and student pieces. This is only the second time this particular drawing has been on public exhibit, the previous time in Joplin in 1973,” Sitton explained.

The drawing on display at the site was created while Benton was a student under the instruction of muralist Ernest Peixotto. It features a seated girl in a gypsy costume and is composed in pen and ink, with an intricate web of lines to build tone and texture. The woman is a model Peixotto brought to the classroom.

During his early years as an art student, Benton was still developing his skills as he experimented with different styles of sketching and painting; he had not developed the unique style he is known for today.

“Benton can be considered a 20th-Century Mannerist painter,” said Sitton. “He uses exaggerated and elongated figures, flowing lines, strong light sources, and rich colors.”

An example of that definitive style can be seen at the State Capitol in Jefferson City. “The Social History of Missouri” is a mural that focuses on a common theme for Benton’s artworks – the action of everyday people on the development of land.

Thomas Benton lived in his Kansas City home from 1936 until his death in 1975. Visitors can view the drawing during a tour of the site, which are conducted on a seasonal schedule. From April through October, tours are held from 10 a.m. to 4 p.m. on Monday, and Thursday through Saturday, as well as from 12 p.m. to 5 p.m. on Sunday. November through March, tours are conducted 10 a.m. to 4 p.m., Monday and Thursday through Saturday as well as 11 a.m. to 4 p.m. on Sunday. Thomas Hart Benton Home and Studio State Historic Site is located at 3616 Bellevue Ave. in Kansas City.

Josh Expose was a 2015 summer intern with Missouri State Parks.



(Above) Visitors to the studio can see the numerous tools and materials Benton enlisted to make his creations.

(Bottom) Knowledgeable interpreters conduct 45-minute guided tours of the Benton studio and home.



The Battle of Island Mound Wins Emmy Awards



The Battle of Island Mound, filmed at Battle of Island Mound State Historic

Site near Butler, won two Emmy Awards at the 2015 Mid-America Emmy Awards Oct. 3, in St. Louis. The film was a collaborative effort between Missouri State Parks and St. Louis-based filmmaker Brant Hadfield. Awards were received for Best Historical Documentary and in recognition of the film's cinematography.

Earlier this summer, Gov. Jay Nixon included a DVD copy of *The Battle of Island Mound* in the Missouri State Capitol's Centennial Time Capsule. The short documentary highlights the story of the Battle of Island Mound, the first instance of African-American troops being directed to oppose

forces aligned with the Confederacy during the American Civil War.

In addition to purchasing the movie online at mostateparks.com/shop/civilwar.htm, the public can view the film as a part of an exhibit at the Bruce R. Watkins Cultural Heritage Center in Kansas City.

Missouri State Parks Marks 1,000th Mile of Trails

Missouri State Parks officially opened the 1,000th Mile Trail at Harry S Truman State Park on Oct. 23.

The 1-mile loop trail, open to day-use hikers, was built primarily by park staff and will feature the interpretation of ongoing glade restoration. Hikers will be able to see and learn about the restoration of the area. The trail includes a scenic overlook with a spectacular view of Truman Lake. With the trail's opening, the state park system

officially includes a cumulative 1,000 miles of trail.

In 2013, Missouri was named the Best Trails State by American Trails, a national, nonprofit organization working on behalf of the nation's hiking, biking and riding trails.

February is Earthquake Awareness Month



Each February, Missouri observes Earthquake Awareness Month. If you

are not already earthquake aware, now is the time to learn and be prepared in the event of an earthquake.

Missourians expect and prepare for the hazards of snow, ice, tornadoes and floods, but the potential for earthquakes may not appear on every family's hazard list.

Time Exposures

The photo at right, titled, "Working on the levee at Bird's Point, Missouri, during the height of the flood," was taken by Russell Lee in January 1937. At that time, the Bird's Point-New Madrid floodway was put into use for the very first time. After dynamite was used to activate the floodway and as the river level continued to rise, men hired by the federal Works Progress Administration filled and stacked sandbags to bolster the land side of the untested setback levee. This prevented floodwaters from reaching rich Missouri farmland.

Lee was hired by the Farm Security Administration Photographic Documentation Project in 1936.

Some of the most iconic images produced by the FSA were captured by Lee, contributing to a collection of images that in 1973 were referred to by author F. Jack Hurley as part of "the greatest documentary collection which has ever been assembled in this country." In 1947, Lee moved to Austin, Tex., and in 1965 became the first photography instructor at the University of Texas.



Photo from the Library of Congress, Prints & Photographs Division, FSA/OWI Collection, LC-DIG-fsa-8a21671.

Send your photo to "Time Exposures," c/o Missouri Resources, PO Box 176, Jefferson City, MO 65102-0176. Original photos will be returned via insured mail. Pre-1980 environmental and natural resource photos from Missouri will be considered. Please try to include the date and location of the picture, a brief description and any related historic details that may be of interest to our readers.

Small earthquakes occur daily in Missouri and three of the largest experienced in the continental United States occurred in Missouri in the winter of 1811-12 in the New Madrid Seismic Zone. The risk of a similar earthquake remains.

Earthquakes are a natural hazard that no one can accurately predict. Preparing and planning is essential for earthquake safety. To raise awareness, geologists with the Missouri Department of Natural Resources will partner with local, state and federal agencies and organizations by participating in a number of public activities to provide educational opportunities relating to earthquakes.

Learn more at dnr.mo.gov/geology/geosrv/earthquakes.htm.

Department Receives \$6 Million for Water Resource Projects

In January 2015, The United States Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) announced funding to high-impact conservation projects across the nation under the new Regional Conservation Partnership Program (RCPP). The RCPP is designed to build partnerships that target conservation goals on a regional or watershed scale.

The NRCS will contribute \$6 million to Missouri DNR through RCPP, with partners contributing \$15.6 million.

This project will use Our Missouri Waters (OMW) to further implement farm practices in basins throughout Missouri. OMW provides a water resource framework that values local leadership and provides technical and financial assistance to aid locals in solving natural resource problems. The primary goals of this project will be maximizing improvements in water quality and wildlife habitat.

Contributing partners include: Missouri Association of Councils of Governments; University of Missouri Extension; Missouri Corn Growers Association; Missouri Soybean Association; Lincoln University; Women,

Food and Ag Network; and the Missouri Department of Conservation.

Former Gas Plant to Become Dental School

The Missouri Department of Natural Resources has issued a certificate of completion to A.T. Still University in Kirksville, allowing the university to build a dental school on the site of a former manufactured gas plant.

In 2005, the department's Brownfields/Voluntary Cleanup Program had issued a certificate of completion for the site, located at 118 S. Wabash St., allowing for it to be used as a parking lot. A.T. Still reopened the site in 2012 to work with the department to determine requirements for ensuring the

area was safe for the dental school.

The parking lot was one of several highlighted in the Fall 2015 *Missouri Resources* story, "From Eyesore to Asset – Rural Brownfield Sites Going Back to Work."

More information on the Brownfields/Voluntary Cleanup Program is available online at dnr.mo.gov/env/hwp/bvcp/hwpvcv.htm.

For news releases on the Web, visit dnr.mo.gov/news.

For a complete listing of the department's upcoming meetings, hearings and events, visit the department's online calendar at dnr.mo.gov/calendar/search.do.

Looking for a job in natural resources? Go to dnr.mo.gov/hr.

OUR MISSOURI WATERS

Watershed Support Continues to Grow

Our Missouri waters are not only essential for our health and quality of life; they also play a critical role in the state's overall economic well-being. Our lakes, rivers and streams provide us with quality drinking water, abundant fish stocks, irrigation, recreation and other vital services. Ensuring we are able to enjoy these waters today, as well as for future generations is a driving force behind the Missouri Department of Natural Resources' mission.



DNR file photo

The department's Our Missouri Waters effort has been empowering those living, working and recreating in Missouri's 66 watersheds to share valuable information with us. These partnerships help keep our precious waters protected – after all they belong to all of us. We're excited to continue this journey and report that conversations are expanding around the state – from the Sac River watershed in southwest Missouri to the Salt River basin in the northeast; from the Upper Mississippi-Cape Girardeau in south-east Missouri to the Lower Missouri-Crooked near Kansas City. Let's keep this momentum going! Learn how you can become involved by contacting your local watershed coordinator by visiting dnr.mo.gov/omw.

The Missouri River Corridor Watersheds include the Independence-Sugar; Lower Missouri-Crooked; Lower Missouri-Moreau; and the Lower Missouri.



Top Spots to Explore Black History



**MISSOURI
STATE PARKS**

*Missouri State Parks – a division of the
Missouri Department of Natural Resources*

(Left) A group of reenactors educated guests about the history of Buffalo Soldiers during an event commemorating the Battle of Island Mound at the historic site near Butler. (Below) African-American CCC workers built this octagonal shelter at Washington State Park near De Soto.

DNR photo by Ben Nickelson

In several of Missouri's state parks and historic sites, guests can learn about history that emphasizes African-Americans' impact in the state. During Black History Month in February, plan a visit to Battle of Island Mound State Historic Site, Washington State Park near De Soto or Scott Joplin State Historic Site, on Delmar Blvd. in St. Louis.

The Battle of Island Mound State Historic Site, located near Butler in Bates County, encompasses 40 acres. The site interprets the Battle of Island Mound, which took place in late October 1862. About 220 members of the First Colored Volunteer Infantry – most of them freed or escaped slaves – marched into Missouri with orders to clear out a band of South-ern-sympathizing guerillas. Although outnumbered, the black troops fought back until the attackers fled.

Black history also is on display at Washington State Park, where some of the park's structures were built by African-American Civilian Conservation Corps (CCC) workers. Some 100 young black men, primarily from the St. Louis area, formed company 1743 and worked at the park from 1934-1939. The CCC projects there include a dining hall decorated with a stone thunderbird, an octagonal shelter high on a bluff overlooking the Big River valley, and the beautiful 1000 Steps Trail.

At Scott Joplin State Historic Site in St. Louis, visitors can learn about the musician who was able to master both the formal structure of classical music and the free-flowing, improvisational, artistic expression of black musicians from the minstrel tradition. The site features a 100-year-old Kimball upright piano. Lit by gaslight, the home is furnished as it would have been when Joplin was composing the songs that would make him a national phenomenon. Visitors can listen to a piano roll of Joplin's famous melodies at the end of the tour.



DNR photo by Tom Uhlenbrock



DNR file photo

DEVIL'S ICEBOX

at Rock Bridge Memorial State Park

Just minutes from Columbia, Rock Bridge Memorial State Park gives visitors the chance to scramble, hike and bicycle through a scenic environment – and lets them peek into Missouri's underworld. One of the park's most popular trails is the Devil's Icebox Trail.

Primarily a boardwalk with several short spurs, viewing platforms and numerous stairs, the trail takes visitors to the most impressive geological features in the park, including the 63-foot-high natural tunnel known as the Rock Bridge, and the double sinkhole entrance to Devil's Icebox and Con-



The half-mile Devil's Icebox Trail loops around the Spring Branch, offering many scenic views.



nor's Cave. Also of interest are a limestone glade, Connor's Spring and a valley formed by the collapse of part of the Devil's Icebox Cave system. Displays tell visitors more about the cave system and the area's history.

Guests also can hike down the stairs to the double-cave entrance. Devil's Icebox Cave is closed to the public. Visitors are permitted to wade in the underground stream at the cave entrance and into the 150-foot-long Connor's Cave, downstream from Devil's Icebox Cave. Flashlights, helmets and good shoes are recommended for the journey.

This natural wonder also has a cultural history. The stream that exits Devil's Icebox Cave and flows through the rock bridge was a source of power for settlers in the 1800s. A stone dam was built at the rock bridge to help harness the water's power to operate a grist mill. The first paper mill west of the Mississippi River was established at the site in 1834, followed by a whiskey distillery in 1847.

A blacksmith shop, store, several homes and roads completed the once-

trails highlight



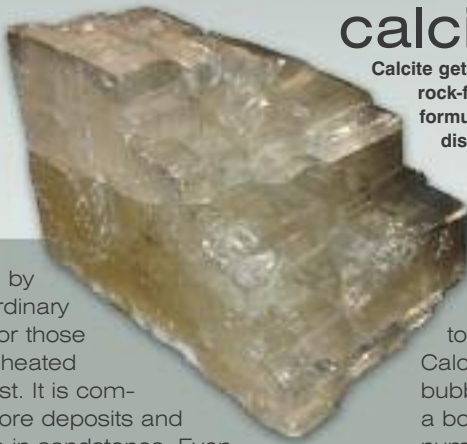
DNR photos by Ben Nickelson

(Top) Guests to Rock Bridge Memorial State Park take part in the "First Day Hike" event on New Year's Day 2015.

(Above) The trail's boardwalk makes for an easy hike, even after a fresh snow.

thriving community of Pierpont (French for rock bridge). The tiny community is just south of the park's southernmost border in Boone County.

Rock Matters



calcite

Calcite gets its name from “calx,” the Latin word for lime. It is a common rock-forming mineral composed of calcium carbonate, with the chemical formula of CaCO_3 . The principal mineral in limestone, it also occurs as distinct crystals within cavities of limestone and dolomite.

(Left) Calcite is a mineral used in many ways, serving as a construction material, a pigment, an agricultural soil additive and an ingredient in pharmaceutical products, among others. DNR photo by Hyland Beydler

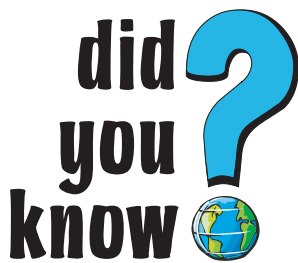
Calcite is deposited by solutions, either ordinary groundwater solutions or those related to the action of heated water in the earth's crust. It is commonly associated with ore deposits and the cementing medium in sandstones. Even the lime deposit in the bottom of a teakettle, water heater or boiler is primarily calcite.

Crystals of calcite vary in size from microscopic to several feet in length and may weigh as much as several hundred pounds each. Some of the largest calcite crystals found in Missouri came from Crystal Cave, near Joplin, where they are called “glass tuff.” Crystal Cave was encountered during the mining of zinc-lead deposits in that area.

Calcite crystals occur in a variety of shapes. In Missouri, they frequently are elongated, sharply pyramidal crystals that resemble the teeth of a dog. Most calcite is colorless, white or pale amber. It is easily scratched with a knife and breaks readily into perfect rhombohedra-shaped (six-sided) fragments. Transparent fragments exhibit the optical property of double refraction. For example, a pencil line viewed through the fragment will appear double.

Since calcite can have many appearances, the simplest way to determine if a mineral is calcite is to test its reaction to a dilute acid such as vinegar. Calcite will readily react with acid by producing small bubbles of CO_2 similar to those formed when you open a bottle of soda and pour it into a glass. Calcite uses are numerous. It is found in many everyday products such as shoe polish, bathroom cleaner and it is in some foods and vitamin and mineral supplements. Calcite is used as an abrasive ingredient in toothpaste to provide cleaning power. It can be used in the manufacture of glass, paper, plastics, thermoplastics, rubber, ink, paint, white-wash, dyes, adhesives, coatings and sealants. Because calcite is in limestone, it is an important ingredient in mortar and Portland cement. Limestone is used in the manufacture of lime that has a wide range of uses including ag lime for agricultural purposes and quick lime for masonry jobs. It also is used for statuary and carvings, and as polished slabs used as facing stone for buildings.

Considering the many uses of calcite, it is a mineral we could not do without. A large calcite specimen is on display at the Ed Clark Museum of Missouri Geology. The museum is located at 111 Fairgrounds Road, in Rolla, and is open weekdays from 8 a.m. to 5 p.m. Learn more at dnr.mo.gov/geology/edclarkmuseum.htm.



U.S. Uses Approximately 400 Billion Gallons of Water Per Day

Our planet is one rich with water, but fresh, clean water is one of our scarcest resources. Fresh water accounts for only 3 percent of the total water on earth, and nearly 69 percent of it is trapped in glaciers.

Americans have access to some of the safest tap water in the world, but how much do we use? An average person in the U.S. typically uses about 100 gallons of water per day for

things like drinking, hygiene and to prepare food, with most being used to flush toilets, bathe and wash clothes.

When we look past what humans personally use, a large amount of our fresh water also is tapped for things like crop irrigation and electricity generation. These two categories alone account for 80 percent of U.S. water usage. This makes water a resource that certainly should not be wasted.

While our lakes and rivers supply much of the water that comes out of our faucets, keeping those water sources clean and healthy helps ensure that our drinking water is among the safest in the world. We each must do our part to help keep it that way.

Read more about how we use water at water.epa.gov/learn/kids/drinkingwater/water_trivia_facts.cfm.



... but not least

Late Geologist Stewart Honored

First discoverer of dinosaur remains in Missouri

by Hylan Beydler

The Bollinger County Museum of Natural History was the place to be October 10, when family members of the late Daniel R. Stewart, a mining engineer with the Missouri Geological Survey and graduate of the Missouri School of Mines and Metallurgy (now Missouri University of Science and Technology), were special guests.

The occasion marked an important discovery in 1942 when Stewart was researching clay deposits in Bollinger County near the town of Glen Allen. While examining an outcrop of clay in a creek bank, a young boy, Ole Chronister, poked his head over the top of the bank and asked what Stewart was doing.

“When Ole learned Dan was researching clay in the area, he told Dan there was clay on his family’s property and he invited Dan to investigate,” said Guy Darrough of Lost

World Studios, manager of the Chronister dig site and director of excavations.

Onsite, Stewart observed several neatly stacked bones the family had found while digging a well. He recognized them as being dinosaur bones, and found more bones 9 feet below the surface. The bones were embedded in clay inside the well, marking the first known discovery of dinosaur remains in Missouri. Lula Chronister, owner of the property, gave the bones to Stewart so they could be examined by paleontologists. They were identified as belonging to a hadrosaur – a plant-eater having more than 1,000 teeth. Chronister sold the bones to the Smithsonian Institution, where they reside today. The hadrosaur named *Hypsibema missouriense* became Missouri’s official state dinosaur in 2004, two years before Stewart’s passing.

Linda Wallace, granddaughter of Mrs. Chronister, and other family members were recognized during the ceremony. Darrough presented Stewart’s granddaughter, LeAnn Gilbert, a plaque created in his honor.

The hadrosaur named *Hypsibema missouriense* became Missouri’s official state dinosaur in 2004, two years before Stewart’s passing.

It was my (author Beydler) pleasure to present LeAnn a reproduction of Stewart’s field notebook in which he noted the bones he observed in the well. Since the mid-1800s our geologists have recorded their observations in notebooks. Thanks to a cooperative effort with the U.S. Geological Survey’s National Geological and Geophysical Data Preservation Program, these books will be available online after all have been scanned. Read more at dnr.mo.gov/geology/fieldnotebooks.html.

Located in Marble Hill, the Bollinger County Museum of Natural History has replicas of the bones, a life-size model of the dinosaur made by Lost World Studios, and more. You can learn more at bcmnh.org and lostworldstudios.com.

The Ed Clark Museum of Missouri Geology, 111 Fairgrounds Road in Rolla, displays replicas of the bones and a model of the dinosaur, also made by Lost World Studios. Learn more at dnr.mo.gov/geology/edclarkmuseum.htm.

Hylan Beydler is division information officer for the Missouri Geological Survey, a division of the Missouri Department of Natural Resources.



Photo courtesy Christopher Wiseman, curator, Joplin Museum Complex

Daniel R. Stewart – his 1942 discovery made history in Bollinger County and Missouri.

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Trout Opening 2016

The opening of the catch-and-keep trout fishing season on March 1 marks the beginning of the season that runs until Oct. 31. Opening officially begins at 6:30 a.m. at Bennett Spring State Park near Lebanon, Montauk State Park near Salem, and Roaring River State Park near Cassville. Make your plans to cast a line this season at mostateparks.com.



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